Space Weather Forecast

Issued on Sunday, 16 January 2022 at 12:40 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of G1/Minor Storm intervals Day 1 (16 Jan). Chance of M-class flares (R1/R2 radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with several Common-Class flares over the past 24 hours. There are currently 7 sunspot regions on the visible disc. Two regions in the northwest quadrant have the most complexity but no significant flare activity. Regions in the northeast and southeast are showing signs of development. The remaining sunspot groups are relatively small and simple.
A Coronal Mass Ejection from the northwest of the Sun on the 15th January may give a weak glancing blow at Earth late on the 16th or early on the 17th, otherwise there are no Earth-directed CMEs visible in imagery.

Solar Wind / Geomagnetic Activity: Solar wind speeds started at slightly elevated levels increasing to reach strong levels above 600 km/s shortly after midnight before easing back to elevated levels around 550km/s. Total interplanetary magnetic field strength, and indeed the north-south component, started at moderate levels before easing to background. Geomagnetic activity was Unsettled to Active, with a G1 interval 15/2100-2359 UTC, it eased to Quiet from 16/0600UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with further Common-class flares expected and a chance of Moderate-class flares. Another two regions are expected to rotate on from the far side within the next two days, and this could also increase solar activity.
Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected, although a CME is expected to pass close to Earth on Day 1 or possibly early on Day 2 (16-17 Jan). The solar wind is expected to be elevated through Day 1, starting to decline from Day 2 onwards. Occasionally Unsettled to Active periods are likely on Day 1, with isolated G1/Minor Storm intervals still possible, and then to a lesser extent through Sunday night into Monday due to possible weak CME influences. Geomagnetic activity is then expected to decline to Quiet to Unsettled levels from Day 2.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at predominantly background levels with no solar radiation storms currently expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	40	40	40
Very Active	R3 to R5 X	No	2	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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